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Journal of the Society of Arts.

FRIDAY, JULY 3, 1863.

COUNCIL.

Wednesday, 30th June, 1863.

At the First Meeting of the present Council since their election, William Hawes, Esq., Vice-President, was unanimously elected Chairman for the current year.

PRIZES TO ART-WORKMEN FOR ART-WORKMANSHIP.

The following notice has been issued by order of the Council* :—

I. The Council of the Society of Arts hereby offer prizes to Art-workmen for the successful rendering of the undermentioned designs in the undermentioned processes of manufacture, according to the directions detailed in each case.

II. Such designs will be by artists of great reputation, to be translated into the various modes of workmanship, and photographs and castings of such designs will be sold by the Society, at the Society's House, at cost price, to persons desiring to be competitors.

III. The works to be executed will be considered to be the property of the producers, but will be retained for exhibition, in London and elsewhere, for such length of time as the Council may think desirable.

IV. The exhibitors are required to state in each case the prices at which their works may be sold, or if sold previously to exhibition, at what price they would be willing to produce a copy.

V. The awards in each class will be of two grades, and the sums specified in each class will be paid, provided the works be considered of sufficient merit to deserve the award; and, further, in cases of extraordinary merit additional awards will be given, accompanied with the medal of the Society.

VI. The prizes will be presented publicly. Before the award is confirmed, the candidates must be prepared to execute some piece of work sufficient to satisfy the Council of their competency.

1. Modelling in Terra Cotta, Plaster, or Wax.

(*a.*) *The Human Figure in bas-relief.*—One prize of £10 for the best and a second prize of £5 for the next best, work executed after *Rafaelle's design of the "Three Graces."* Dimensions—The figures are to be 9 inches high.

[Photograph—One shilling.]

(*b.*) *Ornament in bas-relief.*—One prize of £5 for the best and a second prize of £3 for the next best, work executed after arabesques by Lucas van Leyden, 1528. Dimensions, 12 inches by 6 inches.

[Photograph—Sixpence.]

2. Repoussé Work in any Metal.

(*a.*) *The Human Figure as a bas-relief.*—A prize of £10 for the best and a second prize of £5 for the next best, work executed after *Rafaelle's "Three Graces."* Dimensions—The figures are to be four inches.

[Photograph—One shilling.]

(*b.*) *Ornament.*—One prize of £5 for the best and a second prize of £3 for the next best, work executed after a Flemish salver in the South Kensington Museum, date about 1670, No. 1153. Dimensions—Diameter, 10 inches.

[Photograph—One shilling.]

3. Hammered Work, in Iron, Brass, or Copper.

Ornament.—One prize of £5 for the best and a second prize of £3 for the next best, work executed after an iron German arabesque, about 1520, in the South Kensington Museum, No. 2450. Dimensions—12 inches by 1½ inch.

[Photograph—One shilling and threepence.]

4. Carving in Ivory.

The Human Figure in bas relief.—One prize of £10 for the best and a second prize of £5 for the next best, work executed after a Terra Cotta ascribed to Luca della Robbia, about 1420, in the South Kensington Museum, No. 7610. Dimensions—The plaque to be four inches high.

[Photograph—One shilling.]

5. Chasing in Metal.

(*a.*) *The Human Figure.*—One prize of £10 for the best and a second prize of £5 for the next best, work executed after a reduced copy of *Gibson's "Psyche."*

A rough casting in bronze, on which the chasing must be executed, will be supplied by the Society, price, 12s. A plaster cast may be obtained from D. Brucciani, 39, Russell-street, Covent-garden, W.C., price, 3s. 6d.

(*b.*) *Ornament.*—One prize of £5 for the best and a second prize of £3 for the next best, work executed after a bronze plaque in the South Kensington Museum, No. 1217.

A rough casting in bronze, on which the chasing must be executed, will be supplied by the Society, price 1s.

6. Enamel Painting on Metal, Copper, or Gold.

(*a.*) *The Human Figure.*—One prize of £10 for the best and a second prize of £5 for the next best, work executed after *Rafaelle's design of the "Three Graces,"* executed in *grisaille.* Dimensions—The figures are to be four inches high.

[Photograph—One shilling.]

(*b.*) *Ornament in grisaille.*—One prize of £5 for the best and a second prize of £3 for the next best, work executed after a German arabesque (16th century). Dimensions—The same as the Photograph.

[Photograph—Sixpence.]

7. Painting on Porcelain.

(*a*) *The Human Figure.*—One prize of £10 for the best and a second prize of £5 for the next best, work executed after *Rafaelle's "Boy bearing Doves,"* in the cartoon of the *"Beautiful Gate."* Dimensions, the same as the Photograph. This work is to be coloured according to the taste of the painter.

[Photograph—Ninepence.]

(*b.*) *Ornament.*—One prize of £5 for the best and a econd prize of £3 for the next best, work executed after arabesques by Lucas Van Leyden, 1528, and coloured according to the taste of the painter. Dimensions—The same as the Photograph.

[Photograph—Sixpence.]

8. Inlays in Wood (Marquetry, or Buhl), Ivory or Metal.

Ornament.—One prize of £5 for the best and a second prize of £3 for the next best, work executed after a majolica plate in the South Kensington Museum, 1490, No. 1671. Dimensions—The same as the Photograph.

[Photograph,—One shilling and threepence.]

9. Engraving on Glass.

Ornament.—One prize of £5 for the best and a second prize of £3 for the next best, work executed after arabesques by Lucas Van Leyden, 1528, engraved the height of the photograph; and if round a glass or goblet, repeated so as to be not less than 9 inches long when stretched out.

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* Copies may be had on application to the *Secretary.*

[Photograph—Sixpence.]

10. Embroidery.

Ornament.—One prize of £5 for the best and a second prize of £3 for the next best, work executed after a German example in the Green Vaults at Dresden. Dimensions, according to the taste of the embroiderer.

[Photograph—Sixpence.]

The Council cannot hold itself responsible for any accidents or damages of any kind, occurring at any time.

Each work must be marked with the name of the Art-workman, or, if preferred, with a cypher, accompanied by a sealed envelope, giving the name and address of the Art-workman, and delivered free of all charges, at the Society of Arts, House, John-street, Adelphi, London, W.C., on or before the 31st August, 1863.

The Council desire to remind those who propose to be competitors, that they should make known their intention before the 15th of July, and as much earlier as possible. This information is necessary to enable the Council to make suitable arrangements for the distribution of the awards.

EXHIBITION OF WOOD-CARVING.

On Friday evening, the 26th June, the members of the Wood-Carvers Society and their friends were invited to a special inspection of the works exhibited. The following gentlemen interested in this branch of art were invited to meet them:—Sir Thomas Phillips, Messrs. John Bell, Harry Chester, Henry Cole, C.B., J. G. Crace, J. Hunter Donaldson, C. H. Dresser, W. Dyce, R.A., Peter Graham, S. C. Hall, William Hawes, W. Holland, A. J. B. Beresford Hope, John Jackson, Owen Jones, J. C. MacDonald, Richard Redgrave, R.A., Samuel Redgrave, G. Gilbert Scott, R.A., John Stewart, J. B. Waring, R. N. Wornum, A. Wright, M. Digby Wyatt, and H. Vaughan. Mr. John Bell, member of the Council, took the chair.

The Chairman stated that the present was not a formal meeting, but simply an occasion for inspecting the works exhibited and declaring the awards of the judges, which he would now call upon the Secretary to read.

The awards (which will be found at page 548 of the *Journal*) having been read,

The Chairman asked Mr. Digby Wyatt, one of the judges, to favour the meeting with some remarks.

Mr. Digby Wyatt said he was glad to have this opportunity of meeting the Society of Wood Carvers, feeling that their art was one to which architects were largely indebted in carrying out their designs. One good result of such exhibitions and meetings as the present must be to bring more closely together the art-workman, the designer, and the patron of art, and this could not but exercise a beneficial influence upon all. Mr. Wyatt referred to the extended educational facilities which now surrounded the art-workman, and to various remarkable examples of wood-carving abroad, suitable as models for study and imitation, particularly to some of which he had obtained castings for the Crystal Palace. In reference to the awards of prizes in the present exhibition, he said it might be asked why the judges did not award the first prize in the first division. His answer was that, where subjects involving much difficulty had been attempted, great success had not been attained. The most successful specimen in this department was a subject of a comparatively simple and well-known character, and to this (the figure of Apollo) they had awarded the second prize. In the second and other divisions the judges had recognised merit of the highest order, and had awarded not only all the prizes offered, but extra ones as well. He might observe, that in the production of such subjects as are included in this division, it was important that, in modelling the design in clay, the treatment should be broad and free, but when produced in wood more finish must be given, otherwise the effect would be unsatisfactory; at the same time an excess of detail, degenerating into mere slavish imitation, was a fault even more to be avoided than too much freedom and sketchiness of execution, because the spirit of true art was altogether lost when too much imitative labour was visible. He hoped that, on a future occasion, the exhibition would include photographs and sketches of any great works produced in this department of art during the year, thus supplying the void occasioned by the absence of other than cabinet specimens from such an exhibition; and that architects would assist by sending examples of work produced from their designs, and for which it might be well to offer honorary premiums. Another class whose interest in the art might be greatly stimulated by the offer of "honour to the worthiest" was that of the purchaser, a class needing enlightenment and encouragement even more than the artists. For many years past architects had not, in his opinion, sufficiently appreciated the value of wood-carving as a structural adjunct, though in former days it would be remembered how largely and successfully it was employed. Mr. Wyatt then referred to some of the most remarkable specimens of wood-carving in France, Belgium, Holland, Italy, Germany, and Spain. In France, during the reign of Henry II., wood carving was carried to its highest perfection. There was extreme simplicity of treatment, and the manner in which fine contrasts of light and shadow were obtained without high relief showed the highest skill. Holland and Belgium were singularly rich in this art; the screens and pulpits in the churches in the latter country were works of the greatest excellence. The Rubens style of carving, as it had been called, was admirable, not that Rubens was a carver, but that his designs and those of his school were full of freedom, and their execution, as shown by some of the examples at Antwerp, Brussels, Louvain, Bruges, &c., was of great merit. To return to the present time, no one could fail to recognise in the late International Exhibition what great progress had been made in this art in England since 1851. The French fully recognised this fact, and every Frenchman on the jury, of which he (Mr. Wyatt) was a member, had paid a well-deserved tribute to the wood carvers of this country, from whose rapid advance towards excellence it was felt how much might be hoped for in the future. This was mainly due to the employment in such establishments as that of Messrs. Trollope, and others, of able artists and foremen, who could not only design, but could also, if need be, execute the design, and so were able to instruct, and practically direct to a successful issue the labours of the workman. In the present exhibition the works contributed by Mr. Kendall, of Warwick, were an illustration of what could be produced by an employer, who was at the same time an able designer and a skilful workman. [Throughout his address Mr. Wyatt practically illustrated his remarks by frequent reference to the works of art comprised in the exhibition.]

Mr. Lock read a letter he had received from Mr. Harry

Chester, regretting his inability to attend the meeting. Mr. Lock observed that the Wood Carvers Society felt much indebted to Mr. Chester for having introduced them to the Society of Arts, and thus led to the present exhibition, which he hoped would only be the first of a series. He thought that, on a future occasion, it would be desirable to add to the works of the competitors any remarkable specimens of carving which could be borrowed from their owners. These would afford valuable instruction to the workman. Specimens of carving of an architectural and conventional style might also be introduced with advantage. On a future occasion it would be desirable to announce the conditions of the competition at an earlier date, so as to afford more time for the production of works for exhibition. He hoped Mr. Stewart would favour them with some remarks upon the present state of this art in Italy.

Mr. Stewart complimented Mr. Wyatt upon the interesting remarks he had made on the present occasion. He (Mr. Stewart) felt great interest in all matters connected with art industry. The laws of proportion and rules of art applicable to sculpture generally were those applicable to wood-carving. The study of proportion in nature was the best preparation for an art-workman who really desired to excel, for it was only by patiently observing and carrying out those proportions in art that beauty and variety were attained. The Society of Arts was doing a good work in encouraging such exhibitions as the present. The history of the Society showed how much it had done to foster Art in the last century, and he was glad to find that it was now specially directing its attention to the Art-industries of the country. Mr. Lock had asked him to say a few words on the state of the art of wood-carving in Italy, but he thought that Mr. Wyatt was much more capable of doing so than himself, and he ventured to hope he would add something to the interesting remarks he had already made.

Mr. Wyatt said, that having studied his profession for two years in Italy, he had naturally paid attention to many of the principal monuments, as they might be called, of the art of Wood Carving in that country. In comparing the technical arts of Italy with those of other countries of Europe, it was always to be remembered that Gothic art was an importation rather than a creation. The great abbeys and cathedrals of England and France, sumptuously decorated with carved stall work and screens, had many of them reached a pitch of rare perfection before the Germans transplanted the pointed style to the North of Italy. The wandering Greeks, who, during the early part of the 13th century, were the principal artificers in Italy, unquestionably possessed a power of minute carving in wood which their descendants had retained to the present time, as might still be seen in the curious tablets decorated with multitudes of almost microscopic figures, which were produced in the monasteries of Mount Athos and the Levant. It was not, however, until some time after the revival of sculpture under the Pisani that Italian wood-carving made any conspicuous figure. The most complete set of Gothic stalls he remembered was that which existed in the Cathedral of Palermo. In general style of execution they differed little from cotemporary works of the early part of the 15th century in the Western countries of Europe. In the mixed style, half Gothic, half Renaissance, much very beautiful ecclesiastical wood work had been executed, and in the stalls of the Chapel in the town-hall of Sienna, a very remarkable specimen of the skill the Italians had acquired in the combination of wood-carving with marquetry in the early part of the 15th century, was to be met with. The stalls of the Church of St. Francis, at Assisi, were little less remarkable. From about the year 1300, a large number of graceful ivory carvings were produced in Italy, proving that in cabinet objects very considerable dexterity prevailed. These differed from the cotemporary works of France and England, mainly in the amount of marquetry by which they were adorned; this art there was no doubt the Italians acquired from their early intercourse with the nations of the East, by way of Pisa, Genoa, and Venice. From whatever source this decorative adjunct might have been acquired, there was no doubt that it tended to greatly enrich the effect of the furniture, and general decorations in ornamental woods, which, from the year 1400 onward, increased and multiplied in the palaces and churches of that nursery of the arts. It was, however, with the great revival of antique art that they must mainly associate the creation of a great school of wood carving in that country. To Donatello and Brunelleschi must be awarded the honour of having first devoted their attention to the production of real artistic sculpture in wood. Fellow students at Rome, they had together examined all the relics of antiquity preserved in that locality and, until the later circumstances of his career drew Brunelleschi altogether away from sculpture to the practice of architecture, they executed many beautiful works, more or less in rivalry. The most notable instance of this was recorded by Vasari, who relates that Donatello, having been engaged to execute the crucifix in wood, now preserved in the church of Santa Croce at Florence, showed it to Brunelleschi, who reproached him with his having made his Christ too much like a countryman. A coolness ensued between the friends, and in order to vindicate his superior ability, there was no doubt that Brunelleschi threw all his soul into the execution of the still more beautiful crucifix, which was one of the greatest treasures of the present day in the Church of Santa Maria Novella, in the same city. The story ran that when Donatello went to look at Brunelleschi's work with him he had his apron full of eggs and cheese, which, on catching sight of the crucifix, he let fall, and, turning to Brunelleschi, said, "Thou art gifted to make gods; I, countrymen only." Whatever the relative position of the two artists might have been at that early period in their career, there was no question as to the infinite superiority Donatello ultimately attained in every class of his art, and he (Mr. Wyatt) knew no master whose productions were more worthy of study by the wood carver of the present day. He excelled especially in the art of contrasted relief, and in a consummate knowledge of the effects to be produced upon the quality of shadows by undercuttings, and the use of reflecting surfaces. No one, since the days of the Romans, whose works he so profoundly studied, had so well succeeded in giving effect in the lowest possible relief. Some of his most remarkable works scarcely exhibited a greater salience in any part from the ground than about a quarter of an inch, and yet, by a careful attention to the delicate undulations of the surface, and knowing exactly where to incise, he had managed to produce an amount of dramatic expression and apparent rotundity which was almost incredible. Happily, through the excellent taste and praiseworthy exertions of Mr. Robinson, the South Kensington Museum now contained an invaluable collection of the works of that artist, and of his most able cotemporaries, which could be rivalled in no other country of the world. Among their co-temporaries and successors, the most notable in the art of wood carving were probably Baccio d'Agnolo, the author of the great "*cantoria*" from the church of Santa Maria Novella, at Florence, now in the South Kensington Museum; and Benedetto and Giuliano da Maiano. Because the names of a great number of such artists were not preserved to us, it was by no means to be supposed that there was any dearth of skilful professors of that art, since the multitude of monuments which abound in almost every church, monastery, and palace in Italy left no doubt, not only of their number, but of their talent and most prolific industry. The objects upon which their energies were principally concentrated were carved doors, screens, pulpits, linings to rooms, fittings to sacristies and shops, such as the "*spezzerie*," or drug stores, attached to many of the principal monastic establishments. In furniture, two objects were particularly selected for decoration by the wood carver, the one the great chest, or *cassa panca*, in which the linen and many of the valuables of an Italian household were usually preserved, the upper portion of which served as a settle or large seat, the other the *cassone* or large chests in which the trousseau of the bride, and sometimes her dowry were generally kept. The cabinet was a later piece of furniture and attained its greatest perfection in the great ebony cabinets wrought with marvellous skill at Venice, in the latter part of the 16th century, and subsequently well imitated in France and Germany; one, in the posession of Mr. Holford, in this country, was of the highest order of excellence. For the design of wood carving as applied to church decoration on a large scale the ablest artists were employed, while the execution was entrusted to the ordinary makers of furniture, who had their shops in all the principal cities. Thus, at Perugia, might still be seen, in the Church of St. Agostino, the carvings in the choir by Angelo Fiorentino, after the designs of Pietro Perugino. These were enriched with the most graceful marquetry. The example of Perugino was followed in the same city by his great pupil Raffaelle, whose arabesques on the stalls of the Church of S. Pietro dei Casinensi, executed by Stefano da Bergamo were probably the most beautiful specimens of wood carving now extant in Italy. Michael Angelo, too, in his early years, paid considerable attention to wood carving, and executed a very fine crucifix for the monastery of Santo Spirito at Florence, in the year 1493. Although there was little left so pure in style as these, there was an infinite abundance of that which was more florid, but scarcely less dexterous, in design and execution. The fittings of the great halls in the ducal palace at Venice were admirable examples of this bold design and florid execution, which attained its climax under Andrea Brustolini, while all over the country there were still scattered masses of rococo work, which must have cost vast sums of money, and rarely failed to exhibit a judicious application of the art to architectural embellishment, however faulty in good taste the separate details might occasionally appear to be. The school of Bernini, which, in its florid manner, never hesitated before the difficulties which it presented to the workman in the realisation of the fanciful conceptions of the principal designs, no doubt laid the foundation of that overwrought style, which, passing into France, fluttered and twisted in grotesque, but occasionally very beautiful, combinations of form about the principal monuments of architecture produced during the reign of Louis XIV. The French (as well as the Germans, represented in this country by the immortal Holbein) of the sixteenth century acquired from the Italians a much purer and more elegant style, and, in combination of arabesque with well proportioned mouldings and agreeable conventional ornament, it would be difficult to surpass the bulk of the work produced in the reigns of Francis I. and Henry II. The doors from the church of St. Maclou, at Rouen, by Jean Goujon, of which he (Mr. Wyatt) was fortunate in procuring casts for the Crystal Palace, would well repay the most careful study on the part of any wood-carver of the present day, since, although much dilapidated, in the general scheme of their composition they left little to be desired. The old dexterity of her artists had not been altogether lost in Italy, since it would be in the memory of those present that the large cabinet produced by Barbetti, of Florence, in the Great Exhibition of 1851, successfully competed with the productions of a similar nature of every other country. At Paris, in 1855, in the late Italian Exhibition, and in that of last year, Barbetti still further distinguished himself, and with Giusti, of Sienna, manifested the fact that under proper direction the Italians of the present might fairly rival their great predecessors. Among the contributions from Rome they would no doubt remember a door, beautifully carved and enriched with marquetry, forwarded by the Pope, and intended for one of the apartments of the Vatican. It was his (Mr. Wyatt's) earnest hope that we might at least imitate the Italians in a more serious use of wood-carving than we had hitherto done. The very item last mentioned, that of ornamental doors, could but an emulation be excited as to whose house should have the most beautiful in this country, would suffice to give employment to more than he saw around him for many a long year. They might now walk from one end of the metropolis to the other and scarcely see a single recent external evidence of the power which they certainly possessed, and which that exhibition demonstrated, of enlisting wood into the service of architectural beauty. He trusted that the time was not long distant when they would again see that material really used as it ought to be, not simply worked upon the carpenter's bench, but dealt with more artistically in the studio of the wood carver. If such a result was to be obtained, it was essential that those who practised the art should occupy themselves more with the principles of its judicious combination and arrangement on a large scale, and less with the superficial minutiæ of a pheasant's wing than they now did; in fact, they must for a time, neglect the cuticle in order to rightly apprehend the structure of the skeleton.

Mr. Lock moved a vote of thanks to the Chairman, and to Mr. Digby Wyatt, for their assistance on this occasion. The wood carvers felt much indebted to the Society of Arts for the valuable aid they had rendered them in the furtherance of this art.

These votes having passed with enthusiasm, the meeting separated.

COMMITTEES OF REFERENCE.

COLONIES.

The Committee on Colonies met on Wednesday afternoon, the 1st inst., in conformity with the terms of the resolution agreed to at the last meeting. Lord Alfred S. Churchill, M.P., in the chair.

The Secretary read letters from Lord Lyttelton, Sir Daniel Cooper, Bart., and several others who were unable to attend, many of which contained suggestions for the consideration of the Committee.

Mr. T. M. Mackay writes:—"I beg to say that I think if a communication were made to the various governments, expressing the interest which the Society of Arts takes in the natural development of the Colonies, and that it would gladly extend its honours to those who, by discovery, invention, or even the utilising of products already known, were aiding in this good work, you would find a response from our compatriots all over the world. They are very sensitive, and very proud of such distinctions, and I believe the Colonial Governments would take every means to give the intimation such publicity as would ensure successful results. At a later period it would be time enough to classify the rewards."

Mr. M. H. Marsh, M.P., suggested that flax and hemp were very much wanted, and could be grown to a great extent in many of our colonies. There was also another subject of great importance—the preservation of meat, &c., for shipment. Many of our Australian colonies had a superabundance of beef and mutton, but had no means of exporting it to advantage, whereas in this country it was getting dearer every year, and threatened to be at an extravagant price.

Mr. Arthur Hodgson said that some years ago a trade was opened up in preserved meats, from New South Wales, by Messrs. Dangar and Co., but a difficulty was found in bringing it into general consumption in England, and the Admiralty did not encourage it for naval stores. With the influx of population, arising from the gold discoveries, the colonial consumption and price of meat had increased, and boiling down stock ceased. Although boiling down had recently been again resorted to, a superabundance of sheep or cattle was not likely to continue long, and therefore it was doubtful whether preserved provisions would pay as a commercial speculation.

Sir **CHARLES NICHOLSON** thought that the Council of the Society might advantageously encourage the production in Australia of many tropical staples of commerce. For instance, a premium might be offered for the manufacture of a ton of cane sugar. A Mr. Hope had already entered upon the cultivation of the cane in Queensland, although the locality selected for the experiment was scarcely the most suitable. Another premium might be offered for the first hundredweight of merchantable coffee grown in Australia. Some of the elevations would also be found as suited to the growth of the tea tree as the hills of India. The introduction of the cinchona trees should also be encouraged, and as there was an increasing demand for elastic gums, and many of the Ficus genus were natives of Australia, the collection of the sap, and the transmission of the crude gum, should be recommended; and a premium for the first quarter of a cwt. of caoutchouc, or any similar elastic gum, would be highly beneficial. There were many indigenous fibres to which attention should also be given. One species of Sida (*S. retusa*), a common weed, was already in commercial demand here at a high price, if it could be shipped in quantity. The *Doryanthes excelsa*, and others, might be mentioned. Then there were various perfumed or scented woods, in request by the perfumer and cabinet-maker, such as the Myall and violet wood; and there was a singular natural green-coloured wood, a species of Grevillea. The dugong and other animal oils also deserved more attention, while the trepang and the pearl fisheries might be prosecuted successfully on the coasts. He thought the proposal to increase the number of corresponding members of the Society in the colonies a very useful one, and he would suggest that it be recommended to the Council to elect the following gentlemen connected with Queensland:—Mr. W. H. Wiseman, Albany Island; M. Thouvet, a very intelligent gentleman, who had been most successful in introducing many new objects of culture, &c.; and Mr. W. Hill, the colonial botanist.

Mr. J. G. **KNIGHT** would also suggest the nomination of the following gentlemen connected with the colony of Victoria:—Mr. F. Bosisto, chemist, Bridge-road, Richmond; Professor Halford, Melbourne University; Professor Mueller, Director of the Botanic Garden, Melbourne; and Mr. J. W. Osborne, Survey department, Melbourne. He considered that there was ample scope for the mutual co-operation of the Society with the several colonial governments, and that local official influence might be made useful, in public announcements through the Government Gazettes, and in selecting and nominating Local Committees to examine and report upon products and manufactures, and to correspond with the Society. The Colonial Governments should also be moved to support and encourage industrial enterprise and original investigations, by offering similar sums or rewards to those given by the Society of Arts. He would propose:—"That the Council of the Society apply to the various colonial governments for well-selected samples of such products as are likely to be of commercial value, and to lead to an export trade, particularly specimens of the following articles:—Economic minerals, other than gold; coal; timber of useful kinds, where existing in large quantities, and in localities presenting favourable opportunities of shipment; barks; cotton and other fibres; tobacco; wine; preserved fruits; sugar; arrowroot; maize, and preparations therefrom; animal and vegetable oils, and resins. Also, that the Council of the Society of Arts suggest to the different Colonial governments that the Council are prepared to place in the hands of proper authorities in the Colonies gold medals to be awarded to such scientific persons as are willing to undertake the labour of introducing, collecting, or producing specimens of new articles of raw produce, and supplying useful information respecting them. That the Council tender their offices to the Colonial governments for the purpose of acting on their behalf in the adjudication of any rewards the said Governments may be disposed to offer in favour of the development or useful application of such products as are at present either untried or imperfectly used or applied." He (Mr. Knight) thought that the official influence and prestige of the Government in the Colonies might be beneficial, and the delivery of the medals or awards publicly by the Governor would be appreciated. A Committee from the leading Local Scientific Society might be delegated to examine and report upon inventions, discoveries, &c.

Sir **CHARLES NICHOLSON** thought it was scarcely necessary to seek official aid in this matter, which might very well be worked through the assistance of the Societies in Union in the Colonies, or corresponding members. This was an old-established and purely English institution, and the central body sitting in London was that through which primary action should be taken.

Mr. J. G. **KNIGHT** explained that Government aid had been found eminently useful in Victoria, in the matter of the Exhibition, and otherwise in supplementing reward and stimulating action.

Dr. **MILLIGAN** thought that in their deliberations the introduction and cultivation of spice plants into Australia ought not to be overlooked. Premiums should be offered for the production of nutmegs, pepper, cloves, &c.

Sir **CHARLES NICHOLSON** remarked that but little was yet to be anticipated in that direction until eastern labour was more plentiful. There was a species of wild nutmeg common in North Australia, and there were several indigenous spice barks, specimens of which had been sent to the Exhibition. He looked for much beneficial result from the exertions of such men as M. Thouvet and Mr. Hill.

Captain **BAGOT** thought that the culture of the vine, and the manufacture of wine, might be considered already established. Cotton culture was a commercial speculation which needed no stimulus with present price. The alpaca and Cashmere goat had been successfully introduced. The olive and oil plants from India, China, and Japan, might be worthy of attention. He thought the efforts of the Committee should be most directed towards the northern parts of Australia, which would ere long be colonised, and offered encouraging fields for enterprise and experiment.

Dr. **MILLIGAN** thought that premiums might with advantage be held out for:—1. The discovery and development of rich metallic ores, and of other vegetable and mineral products, &c., such as gypsum, graphite, rock salt, and guano. 2. Economy of time, labour, and material in the separation of gold and other metals from their matrix and from their alloys, &c. 3. The introduction into the market of a really good steam-coal, the product of one or other of the Australian colonies. 4. The procuring and applying of very cheap oils from mineral and other sources to the purposes of illumination, of lubricating machinery, and for use in the arts, &c. 5. The introduction into common use of new or lately-discovered essential oils, with their applications in medicine and the arts. 6. The production in adequate quantity and at a suitable price, of a substitute for rags as a material for papermaking, or of substances calculated to come to the aid of the papermaker. 7. The introduction and acclimatising in the Colonies of animals and of vegetables capable of yielding materials calculated to prove extensively useful as articles of food; or for purposes of clothing, silk, cotton, flax, &c., would fall under this head.

After some observations by the **CHAIRMAN**, Mr. P. L. **SIMMONDS**, and others, the meeting broke up.

UNIVERSAL EXHIBITION IN PARIS FOR 1867.

The *Moniteur* contains a decree, signed by the Emperor Napoleon, announcing that a universal exhibition of agricultural and industrial products is to take place in Paris from the 1st of May, 1867, to the 30th of the following September. The decree is preceded by a report from M. Rouher, who says:—

"The commission which met on the 5th of June was unanimously of opinion that the industrial and moral advantages of universal exhibitions are becoming more and more evident. Producers have derived much practical utility from them, and their foremen and workmen also. They have learnt to improve their systems of manufacture, and to extend the circle of their commercial operations. The savans and artists who form the international jury generally agree in considering that these competitions stimulate the progress of science and art. Moreover, if this exhibition is arranged so as to attract a large number of our countrymen and foreigners, it will be a considerable source of profit to the city of Paris, while at the same time it will favour the influence of the French nation, and the development of its relations of all kinds. The commission was of opinion that a feeling of just emulation ought to urge France after the Exhibition of 1862 as of that of 1851, to follow England, and attempt for the second time this great undertaking. In addition to these general advantages, there are others which the presence of the savans and industrials of every country enables us to obtain. Thus the International Commission of Weights and Measures, instituted in 1855, in connection with the Universal Exhibition, contributed by its labours to propagate in Europe the metrical system. Important questions of science, commerce, and finance might also be usefully discussed in similar conferences."

M. Rouher, in conclusion, proposes that that the Exhibition of 1867 should be "more thoroughly universal" than its predecessors, and that to this end it should embrace, as far as possible, the industrial products of all countries, as exemplified in every branch of human activity. He recommends the immediate publication of his report, in order that the most distant nations may make their preparations in time. A Fine Art Exhibition is to take place at the same time as the Industrial Exhibition.

ASSOCIATION FOR THE PREVENTION OF STEAM-BOILER EXPLOSIONS, MANCHESTER.

At the meeting of the Executive Committee of this Association, on Tuesday, April 28th, 1863, James Petrie, Esq., of Rochdale, in the chair, Mr. L. E. Fletcher, chief engineer, presented his Monthly Report, of which the following is an abstract:—

During the past month there have been examined 288 engines and 406 boilers. Of the latter, 6 have been examined specially, 11 internally, 79 thoroughly, and 310 externally; in addition to which, 2 have been tested by hydraulic pressure. The following defects have been found in the boilers examined:—Fracture, 5 (one dangerous); corrosion, 30 (one dangerous); safety-valves out of order, 1; water-gauges, ditto, 8; pressure gauges, ditto, 9; feed apparatus, ditto, 1; blow-out taps, ditto, 32; furnaces out of shape, 4; over-pressure, 4; blistered plates, 4.—Total, 98 (two dangerous). Boilers without glass water-gauges, 6; without blow-out taps, 13; without back pressure-valves, 21.

Some explosions occur at too great a distance from Manchester to admit of a personal investigation, and of these little or no reliable information can be obtained at the time. Of one such which took place last year, and of which the fact of its occurrence only was therefore recorded in the reports, there has since been, through the kindness of the engineer who investigated the explosion immediately after it happened, full information with regard to it, as well as a drawing of the boiler after rupture, both of which are placed at the disposal of the Association. From these it appears that the boiler in question was of plain Cornish construction, and that the explosion resulted from collapse of the internal flue tube.

The explosion was attended with fatal consequences, the rush of steam and water from the flue blowing down the end wall of the boiler-house, abutting against a public thoroughfare, in which the workmen of the establishment, most unfortunately, were assembling around the gates of the premises, a few minutes before bell time. The steam, water, and bricks were all scattered amongst the group, and five lives sacrificed.

The length of the boiler was 26 feet; the diameter of the shell, 7 feet; that of the internal flue, 4 feet; and the thickness of the plates in both, three-eighths nominally, while at the centre of the flue it was found, after the explosion, to have been but little more than one-quarter. The boiler had been purchased second-hand, while the workmanship is reported to have been inferior, and the flue tube, though supposed to be circular, to have proved actually oval at the middle of its length. This flue was not strengthened by flanged seams or hoops, while the working pressure was 50 lbs. to the square inch.

Under these circumstances it is clear that the simple weakness of the flue was the cause of explosion, which must, therefore, be added to the already long list of those which could have been prevented by the simple precaution of strengthening the flue, either with flanged seams or hoops, while the weakness could not have escaped detection on competent inspection, or practical exposure on the application of the hydraulic test.

No. 6 explosion, like the preceding one, occurred at a considerable distance from Manchester, and, although it took place last month, was only reported within the last few days; and there has as yet been no opportunity of obtaining further particulars with regard to it than that the boiler was of plain, cylindrical, egg-ended construction, externally fired, and was thrown by the explosion to a considerable distance from its original seat, which is always the case with this description of boiler.

Neither of the two boilers just referred to were under the inspection of this Association.

Three explosions have occurred during the past month to boilers not under the inspection of the Association, by which nine persons were killed, and four others injured. All of these explosions occurred so far from Manchester that only one of them—viz., No. 8, which was by far the most important—had been personally investigated. The following is the monthly tabular statement:—

Tabular Statement of Explosions from March 28, 1863, to April 24, 1863, inclusive.

Index No.	Date.	General Description of Boiler.	Persons killed.	Persons injured.	Total.
No. 7.	April 7.	Plain cylindrical. Externally fired........	0	0	0
No. 8.	April 8.	Four cylindrical egg ended. Externally fired ... . One ordinary single flue, or "Cornish." Internally fired...... (These five boilers all exploded simultaneously.)	9	4	13
No. 9.	,,	Plain cylindrical. Externally fired.........	0	0	0
Total			9	4	13

No. 8 Explosion.—This explosion occurred at an ironworks, and is one of the most remarkable that have come under the notice of this Association—five boilers, working side by side, having in this instance exploded simultaneously, the shells of all of them being rent asunder, and

thrown to a considerable distance from their original brick-work setting, which was completely destroyed, and reduced to a heap of ruins. The fragments and boiler fittings were shot in every direction, many of them falling through the roofs of the adjoining buildings, and one through that of the dwelling-house of the proprietor. Two of the boilers were thrown over a tramway, and landed in a ploughed field beyond; one of them raking the rails in its course, cutting them completely through at the solid metal, and tearing up the roadway, a piece of one of the rails, that had been shorn off, being carried away to a distance with the boiler.

The five boilers were ranged side by side, all of them being connected, both by the steam-pipe and feed-pipe. Their direction was very nearly north and south, the furnaces being at the south end. No. 1 boiler, commencing at the west, was of Cornish construction and internally-fired, while the remaining four were cylindrical, with egg-ends, and externally-fired. The length of all the boilers was about 25 feet, while the diameter was 6 feet in No. 1, and 5 feet in the remaining four, the thickness of the plates being seven-sixteenths in the former, and three-eighths in the latter. The boilers were each fitted with one feed back-pressure valve and feed stop-valve combined, one glass water-gauge, one alarm low-water steam whistle, worked by a float fixed inside the boiler, and one lever safety-valve, of 4 inches diameter, in addition to a Bourdon's pressure-gauge fixed on the steam-pipe at some distance from the boilers. The safety-valve admitted of nearly 60 pounds per square inch, but it was stated that 45 pounds had been the limit at which the boilers had been worked, since the weight had always been placed at some distance from the end of the lever. Even the higher pressure, however, would not have been excessive for boilers of such dimensions, as far as the cylindrical shells are concerned.

The rents were extremely complicated by the effects of the explosion, and although highly important to do so, it is in these cases difficult to determine which are the rents from which the explosion sprung, and which are those that resulted from it; or otherwise, which rents are the primary ones, and which the secondary ones. It appeared, however, that all the egg-ended boilers had rent in two, transversely, one portion flying northward and the other southward, the rent occurring at one of the transverse seams over the furnace, while the larger portion had in every instance flown northwards. In some cases both ends were blown out, and the plates "vandyked" and curled up, the distortion being such as is difficult to describe. These latter effects were due to the flight of the parts and the consequent shock on grounding, and may be considered as secondary, while it is clear, from the direction in which the parts had flown, as well as from the character of the rents themselves, that the primary ones, from which the explosion had sprung, were those at the transverse seams over the furnace.

The Cornish boiler was also rent transversely, at about the middle of its length, both through the shell and flue tube, the end furthest from the furnace being demolished, the shell being opened out, ripped spirally, and the end plate torn off. The other half of the boiler was comparatively uninjured, the whole, though thrown from its original seating, holding together, and the furnace retaining its cylindrical shape.

There is no reason for attributing the explosion either to a deficiency in the number of the fittings, to unwise or excessive pressure, or to shortness of water, but to the weakness of the transverse seams over the furnace,—to which all externally-fired boilers are found to be liable,—aggravated in the present instance by the use of sedimentary water and the mode of introducing it, by which it was injected directly upon the plates at the bottom of the boiler, and immediately over the fire.

There still remains to be explained the fact of the whole series of five boilers having exploded simultaneously.

The percussive force of water, as an important element in producing the destructive effects in steam boiler explosions, has lately excited considerable attention, and is a subject of much interest. The view is as follows:—The temperature of water in a steam-boiler working at 50 pounds pressure, is 300°, which is 88° above the boiling point at atmospheric pressure. On the occurrence of a rent above the water-line, or the rending off of a steam dome, the blowing-off of the man-hole cover, or the fracture of a steam-pipe, &c., the steam above the surface of the water would escape and remove the pressure from it. The 88° of free heat, with which the whole body of water is charged, over and above that necessary for maintaining it at the boiling point at atmospheric pressure, would instantly flash a considerable portion of it into steam, while the globules, not being generated at the surface merely, but throughout the whole mass, would blow up the water with considerable force, converting it into a projectile, having a velocity equal to that due to the pressure. This would give it a destructive force far greater than that of the simple statical pressure of the steam; just as in the injector the stream of water acquires a force of penetration that renders it superior to the pressure of the steam that imparted it, and which enables it to enter a boiler working at a higher pressure than the one supplying the injector. It is thought, by its advocates, that on this principle it is possible that an explosion might happen, without either the existence of any previous weakness of the boiler, the occurrence of any primary rent, or excessive pressure, but simply from the sudden removal of the steam from the surface of the water, when it would be violently projected, as just explained, against the upper part of the shell. It has been proposed to submit this to the test of experiment, and to accomplish the instantaneous clearance of the steam space, either by condensation, effected by the introduction of a jet of cold water, or by the opening of a large valve. Such an investigation would certainly be most interesting and useful, while the result would be highly prized by the engineering world. Of the fact of the sudden liberation of the steam throwing up the water there can be no question, since that is already a matter of experience; whether, however, the entire steam space can be so instantaneously cleared as to allow a sufficient velocity of the water being attained—on the accomplishment of which the force of impact depends—appears to me a matter of question, and I cannot but think that steam would be generated with sufficient rapidity on the surface of the water, to retard the velocity of the mass, as well as to form a cushion which would soften the blow against the shell of the boiler. This is a nice point, and must await the issue of the experiment for determination. I have for some time since, in examining exploded boilers, carefully searched for indications of this action, and it appeared at first that there were manifestations of it in the explosion under consideration. For instance, the feed water had been introduced, as previously stated, at the top of the boiler, the feed stop-valve being bolted to the side of the steam dome, and the water carried by the feed-pipe through the steam space. The failure of this feed-pipe would have allowed the water to play amongst the steam, and thus produce the very condensation desired in the proposed experiment just mentioned; added to which, the steam domes were torn off from the shells, as if by upward impact, and blown in a different direction to the boilers themselves. The feed water, however, proved to have been heated by the exhaust steam from the engine, and thus would have produced but tardy condensation; and even if the flight of one boiler, on the rending of the transverse seams over the furnace had carried away the steam pipe, or rent off the domes of the others, which is highly probable, and thus by suddenly relieving the steam-pressure, set up this percussive action—still, the force of the impact, which must have been upward, can hardly be supposed to have developed the transverse rents previously described, or to have thrown one-half of the boiler to the south and the other to the north. With a full appreciation of the value of the impact theory, it is not thought that it implies in the present instance, as having produced primary rents, important as it may have been in developing secondary ones, but every opportunity will be taken of watching for its manifestation, and communicating the results to the members.

The cause of the simultaneous explosion is thought to have been as follows:—A single externally-fired egg-ended boiler, say No. 3, rent at one of the traverse seams over the furnace in the first instance. The escape of steam and water from the bottom of the boiler then lifted the remaining ones, and threw them up in the air several feet high, blowing down at the same time the brickwork seating, so that the boilers, on coming again to the ground, fell upon a loose irregular bed, and all became so strained that each rent and exploded in turn. That the percussive action of the steam was sufficient to have done this, is illustrated by the fact, that one of the cast-iron rolls from the mill was lifted by it at the time of the explosion to the height of several feet.

A reference may be of assistance, to a very similar explosion which occurred last year, the particulars being given in the monthly report for March, 1862. In that instance there were four boilers set side by side, and connected together; three of these were egg-ended and externally fired, while the fourth was a Cornish boiler. The three former were at work and all exploded simultaneously, while the latter, not having steam up, escaped, but had evidently been lifted some considerable height by the explosion of the others, and on its fall rent at the bottom of the shell transversely, and the flue tube was also dislocated at its connection with the end plate. The fall had made such serious rents in the shell, that had there been any steam in the boiler at the time, an explosion must inevitably have followed. This, it is thought, affords the key to the explanation of the simultaneous explosion of the five boilers under consideration, and which, it is concluded, was due simply to the fracture of a single externally-fired boiler, at the transverse seams over the fire, in the first instance; and to the effect upon the others, of the percussive action of the steam and water escaping therefrom, in the second.

Explosions No. 7 and No. 9 were very similar in character one to the other. Neither of the exploded boilers having been personally examined, only the following scanty particulars have been obtained:—

No. 7 explosion occurred at a colliery to a cylindrical externally-fired boiler, 36 feet long and 5 feet in diameter. This boiler formed one of a series of five, being the second from the engine-house. It was rent by the explosion into four pieces, while the escape of steam and water blew up the boiler seated next to it, which was the centre one of the series, flattening it on one side, reversing it end for end in position, and rolling it over the other boilers, finally depositing it on the ground beyond. It will be seen that the treatment of this boiler, on the rupture of the one alongside of it, corroborates the view given with regard to the cause of the simultaneous explosion of the five boilers referred to above, and it is hoped that fuller particulars may be obtained.

No. 9 explosion occurred at an ironworks, to a cylindrical externally-fired boiler, about 32 feet long and 5 feet diameter, which was the outer boiler of a series of five.

It will be observed that the seven boilers which have exploded during the month have all been of the egg-ended, externally-fired class, with the solitary exception of the Cornish one, which suffered only through the explosion of the others; and it is trusted that the fact of the constantly recurring failure of these externally-fired boilers will at length dispel the false estimate so generally entertained of their safety. The proprietor of the ironworks at which No. 8 explosion occurred, at once adopted the wisest course, and resolved upon having no more of the externally-fired class upon his works, but laying down "Lancashire" boilers in their place; experience having show him that the plates over a furnace of an internally-fired boiler may fail without moving it off its seat, or causing any loss of life; while with an egg-ended boiler its entire rupture and the flight of the parts, as in No. 7 explosion, is the result.

In another case one of our members, employing several of these externally-fired boilers, has found them to crack at the transverse seams, without warning, for a length of two feet, and consequently determined, as in the previous instance, to condemn them altogether; while to prevent rupture in the meantime, before they can be replaced, contemplates lashing the two ends together with strong longitudinal stays, so as to prevent their flying apart should failure at the transverse seams occur.

THE NEW TOBACCO ACT.

The following are the principal Provisions of the New Act 26 Vic., cap. 7, which came into operation on 28th March:—

Duties Payable on Manufactured Tobacco.

		s.	d.
Segars	per lb.	5	0
Foreign Cavendish or Negrohead. . . .	,,	4	6
Snuff, containing more than 13 lbs. of moisture in every 100 lbs. weight thereof . .	,,	3	9
Snuff, not containing more than 13 lbs. of moisture in every 100 lbs. weight thereof.	,,	4	6
Other Manufactured Tobacco	,,	4	0
Cavendish or Negrohead, manufactured in Bond	,,	4	0

Duties Payable on Unmanufactured Tobacco.

		s.	d.
Containing 10 lbs. or more of moisture in every 100 lbs. weight thereof . . .	per lb.	3	0
(With 5 per cent. thereon.)			
Containing less than 10 lbs. of moisture in every 100 lbs. weight thereof	,,	3	6

No tobacco to be examined as to the quantity of moisture contained therein, except by special order of the Commissioners of Customs.

A drawback of 3s. 3d. per lb. to be allowed on tobacco of home manufacture, on the same being by any licensed manufacturer exported or deposited in any bonded warehouse for use as ships stores, provided such tobacco contains 13 per cent. of moisture; a proportionate increase or reduction to be made as the amount of moisture varies below or above that standard. There are further conditions, relating to the quantity of inorganic matter in such tobacco, and no drawback will be allowed on tobacco containing more than 2 per cent. of sand, or 25 per cent. of tobacco stalks.

Cavendish or negrohead tobacco may be manufactured in bond, and materials or ingredients for sweetening or flavouring the same (not being leaves of trees or plants other than the tobacco plant), may be used in such manufacture. Both cavendish and negrohead of British or foreign manufacture on which duty has been, or shall be, paid, may not be delivered for home use, except under specified conditions, namely, made into separate packets, not exceeding one pound, nor less than one ounce each, enclosed in an approved wrapper, fastened by a label provided by the Commissioners of Customs, full duty to be paid thereon before such packets be made; stalks, waste, and other refuse remaining after the manufacture, to be destroyed, or re-warehoused for exportation. The labels to be printed or stamped with such device as the Commissioners of Customs may adopt, and forgery thereof is punishable by imprisonment with hard labour. Any retail dealer in, or vendor of cavendish or negrohead tobacco labelled, as required by the Act, failing on the sale thereof to obliterate such label before delivery to the purchaser, will be liable to a penalty of £20. Cavendish or negrohead manufactured in bond, not packed according to the above conditions, to be re-warehoused for exportation, or for future packing.

Foreign cavendish or negrohead tobacco containing leaves of trees or plants other than the tobacco plant to be forfeited, and the importation of manufactured tobacco other than cavendish or negrohead, adulterated with any ingredient whatever, is prohibited under a penalty of £100. Any manufacturer of or dealer in tobacco who, at the time of the passing of the Act, shall be in possession of any duty-paid foreign cavendish or negrohead tobacco, to have the same packed and labelled according to the above conditions within 28 days, under a penalty of £20.

The Commissioners of Customs to make such rules from time to time as shall appear to them necessary for the due observance of the conditions required by the Act.

PAPER MATERIAL.

In searching for fibre suited for the manufacture of paper, the following hints may be found useful to residents in tropical and other regions.

Any fibre capable of cohesion when precipitated on a draining surface from mechanical suspension in water, after having been reduced to a pure state of capillary subdivision by mechanical action, is fit for the manufacture of paper.

For all practical purposes it may be accepted as a rule, that for the manufacture of white paper all fibres require bleaching.

Raw fibre may be divided into four classes:—

1. That which is easily reduced and easily bleached.
2. That which is easily reduced, but difficult to bleach.
3. That which is difficult to reduce, but easily bleached.
4. That wherein perfect bleaching involves the integrity of the fibre.

The most profitable shape in which to send fibre to the English market is that of half-stuff (or pulp). Well prepared bleached half-stuff would fetch £25 per ton in the market.

The best machine for reducing fibre to half-stuff is the ordinary rag-engine, costing about £150, carrying about 2 cwt. of stuff, and requiring a maximum of seven-horse power for driving. The half stuff would require to be pressed, dried, and packed in bales. For experimental purposes in reducing the fibre, anything smaller than the ordinary sized rag engine is useless, as the weight of the triturating roll—about 15 cwt.—cannot be dispensed with, so that laboratory experiments are necessarily confined to rough separation and bleaching. Moreover, laboratory experiments, unless conducted with the utmost care and skill, furnish no reliable data for commercial operations. As a preliminary, the character of the fibre ought to be determined in the laboratory:—

1st. In relation to its structure, having in view ease in fibrous separation.

2nd. In relation to its chemical construction, having in view ease in bleaching.

Bleached half-stuff would realise a larger profit than unbleached, always supposing that the process of bleaching, owing to the accident of geographical position or otherwise, did not entail expenses extra to that properly belonging to the operation under the most favourable circumstances.

Fibre could be sent into the market as half-stuff unbleached whenever its characteristics were reliably established.

EXAMINATION PAPERS, 1863.

The following are the Examination Papers set in the various subjects at the Society's Final Examinations, held in May last:—

ARITHMETIC.

THREE HOURS ALLOWED.

(No marks will be allowed for answers where the working is not shown.)

1. Find by practice the cost of $3960\frac{1}{12}$ articles at 4s. $6\frac{1}{2}$d. each.

2. What is the rent of 225 acres 1 rood 19 poles at 13s. $2\frac{1}{2}$d. per rood?

3. If a railway fare for 77 miles be 22s. what will be the expense of travelling 364 miles, and what the rate per mile?

4. What part of 35s. is $\frac{5}{12}$ths of 24s.?

5. Find the value of $\frac{7}{9}$ths of $\frac{9}{14}$ths of $\frac{3}{5}$ths of £3 4s. 6d.

6. If the carriage of 17 cwt. 3 qrs. for $7\frac{1}{2}$ miles cost 20s. $8\frac{1}{2}$d., what weight should be carried 20 miles for 16s. 4d.? Work by decimals.

7. Find the difference between $6\frac{1}{2}$ guineas and £3·525, and reduce it to the decimal of a crown.

8. Divide £8 3fl. 7c. among four persons; giving the first $1\frac{1}{2}$ as much as the second; the second $1\frac{1}{4}$ as much as as the third; and the third $1\frac{1}{6}$ as much as the fourth.

9. A poor rate of £530 is to be levied from three parishes, the population being respectively 2,500, 3,000, 4,200. How much should each parish pay, and how much each person?

10. If I spend in 6 months as much as I earn in 4 months, how much shall I have saved at the end of a year if my earnings every 6 months are £183 17s. 6d.?

11. If sugar be sold at the rate of 5d. per lb., how much should it be bought at per cwt. to gain 25 per cent.?

12. For what sum should a ship worth £3,000 be insured at 3 per cent. in order to cover its value and the premium?

13. During the first 6 months of the year the income-tax is at the rate of 7d. in the £; but during the last 6 months it is at the rate of 5d. in the £. If a person's income, after deducting the tax, be £819, what is his gross annual income?

14. A person has £3,400 of 3 per cent. stock. He sells out at $77\frac{1}{8}$ and buys 5 per cent. stock at 106. How is his income affected?

15. How many bricks will be required to build a wall 8 feet high, 1 foot 8 inches thick, and 5 poles in length; the dimensions of a brick being 10 inches long, 4 inches broad, and $2\frac{1}{2}$ inches thick?

16. A watch which is 5 minutes slow at noon on Monday gains 3 minutes 20 seconds daily; what will be the true time when it points to 6 o'clock on the following Saturday evening?

17. If a person has to pay £120 in 8 equal monthly instalments, when may he equitably pay it all at once?

18. A quantity of railway stock is sold at 108 and the proceeds invested in the 3 per cents. at $91\frac{1}{8}$; the 3 per cent. stock is then sold at $95\frac{3}{8}$, and the original stock is repurchased at 109. The profit on the entire transaction is £109. Find the amount of railway stock.

19. The alloy in English silver is $\frac{3}{40}$ths of the whole, and in French silver $\frac{1}{10}$ of the whole, and the par of exchange between the two countries is 25 francs 22 cents., the weight of a franc being 77·16 grains. Find the price of English standard silver per ounce.

20. A. and B. can do a piece of work in 30 and 36 days respectively. They work together for 6 days, when B. leaves, but A. goes on, and after 6 days is joined by C., and then they finish the work together in 8 days. In how many days could C. alone have done the work?

BOOK-KEEPING BY DOUBLE ENTRY.

THREE HOURS ALLOWED.

1. In what consists the distinction between the double entry and the singly entry method?

2. Does double entry secure the detection of all errors to which a book-keeper is liable?

Note.—Reasons to be stated for the answer given to this question.

3. What are the respective uses of the Journal and Ledger?

4. Can books be kept by double entry without a Journal?

5. What should a profit and loss account and a balance sheet severally exhibit?

6. Journalise and post in due technical form and language the following supposititious transactions, and make out from the Ledger—a trial balance, a profit and loss account, and a balance sheet.

On the 1st January, 1863, John Hodge and Charles Wright found the state of their partnership affairs to be as follows:—

Liabilities.

Due to John Hodge, Capital	£2,000	0	0
„ Charles Wright, Capital	1,000	0	0
„ John Roe	450	0	0
The Firm's acceptance due 30th January...	820	0	0
	£4,270	0	0

Assets.

Cash at the Bankers	£1,250	0	0
Petty Cash in hand	5	15	0
Due from James Pott	164	5	0
„ Henry Nix	50	0	0
Bill Receivable due 15th February	400	0	0
Stock of Wine, 50 pipes	2,400	0	0
	£4,270	0	0

The Capital of the Partners bears interest at £5 per cent. per annum, and the net profits are divisible between the two partners in equal moieties.

Transactions.

1863.				
Jan. 1.	Sold 10 pipes of wine to Henry Green	£550	0	0
„	Bought 20 pipes of Wine of Charles Brown	800	0	0
9.	Received Cash from O. G. & Co. proceeds of Bill receivable for £400 due 15th Feb. discounted with them	397	15	0
„	Discount charged by O. G. & Co....	2	5	0
12.	Paid Cash to Charles Brown	760	0	0
„	Trade discount allowed by Charles Brown	40	0	0
15.	Received Cash from James Pott on account	100	0	0
20.	Sold James Pott 2 pipes of Wine...	140	0	0
25.	Received of Henry Green his acceptance at 2 months, due 28th March	550	0	0
30.	Accepted John Roe's draft at 4 months' date	450	0	0
„	Cash paid our acceptance due this day	820	0	0
31.	Cash paid Clerk's salary 1 month...	15	0	0
„	Paid out of Petty Cash sundry trade charges	1	16	0
„	Paid out of Petty Cash on private acct. of J. Hodge	8	0	0
Feb. 1.	Advanced to Petty Cash	10	0	0
„	Cash drawn out by the partners on their respective private accounts, viz.:— John Hodge ...... 60 0 0 Charles Wright ... 50 0 0	110	0	0
2.	Sold to Richard Love 20 pipes of Wine at £50	1,000	0	0
„	Consigned to Sydney on our own account and risk, through Small & Co., 10 pipes of Wine invoiced at	600	0	0
10.	Received of Small & Co. Cash as advance on consignment to Sydney	330	0	0
15.	Bill receivable due this day returned dishonoured by acceptor, J. Nokes	400	0	0
„	Notarial charges thereon paid out of Petty Cash	0	3	6
20.	Cash received of John Nokes on account of his dishonoured acceptance	200	0	0
21.	Purchased of Henry Jones 15 pipes of Wine	750	0	0
„	Sold to H. Cox 5 pipes of Wine ...	450	0	0
„	Cash paid, Freight, Insurance, and charges on consignment to Sydney	75	0	0
23.	Received of H. Cox, Cash	200	0	0
	His acceptance due 26th May	100	0	0
24.	Received of Richard Love his acceptance due 27th of April	600	0	0
28.	Value of Stock of Wine remaining on hand at this date	1,700	0	0
„	Due to H. Good for stationery	7	10	0
„	„ H. Knott, one month's salary	15	0	0
„	„ „ J. Craig, two months' rent...	20	0	0
„	Credit partners' accounts with 2 months' interest on their Capital, viz.:—			
	John Hodge on £2,000	16	13	4
	Charles Wright on £1,000	8	6	8
„	Debit partners' accounts with interest on sums drawn on private Account, viz.:—			
	John Hodge 1 month on £60 ...	0	5	0
	C. Wright 1 month on £50 ...	0	4	2
„	Credit John Hodge his moiety of balance of Profit and Loss account			
„	Credit Charles Wright do. do.			

ALGEBRA.

THREE HOURS ALLOWED.

(A.)

1. State and account for the rules of signs in Algebraical Multiplication.

2. Find the value of the combined product of the factors $x+1$, x^2+1, x^4+1, x^8+1, and the product of this again by $x-1$.

3. Find the greatest common measure of 484 and 693, and then prove from your process,

1st, That the number so determined is a common measure; and

2nd, That it is contained in every other common measure of the two given numbers.

4. Reduce the quantity—

$$\left(\frac{a+b}{c+d}+\frac{a-b}{c-d}\right) \div \left(\frac{a+b}{c-d}+\frac{a-b}{c+d}\right)$$

to its simplest form.

5. If $a : b :: c : d$, prove that—

$$\frac{ma + nb}{a + qb\,p} = \frac{mc + nd}{pc + qd}$$

6. A boating crew, who can pull eight miles an hour in still water, find that it takes them two-thirds more time to go up a river than to go down it. Find the rate at which the river flows.

7. Find x, y, z from the equations—

$$\frac{x}{a}+\frac{y}{b}=1;\ \frac{x}{a}+\frac{z}{c}=1;\ \frac{y}{b}+\frac{z}{c}=1.$$

8. Solve the equation—

$$\frac{x}{x+1} + \frac{x+1}{x} = 2\frac{9}{10}$$

And also the equation—

$$\sqrt{x+a} - \sqrt{x} = \sqrt{x+b}$$

B.

9. Find the third term and the sum of the geometrical series of which

$$\frac{\sqrt{2}+1}{\sqrt{2}-1} \text{ and } \frac{1}{2-\sqrt{2}} \text{ are the first two terms.}$$

10. In how many different ways can 9 people arrange themselves in a ring, with one of them in the centre?

11. Calculate the cube root of 999 to at least eight places of decimals by the Binomial theorem.

12. Solve the equations:—

$$x^2 - xy = 10$$
$$xy + 2y^2 = 33.$$

*13. If $\frac{1}{a} + \frac{1}{b} + \frac{1}{c} = \frac{1}{a+b+c}$

Prove that $\frac{1}{a^3} + \frac{1}{b^3} + \frac{1}{c^3} = \frac{1}{(a+b+c)^3}$.

(*To be continued.*)

Home Correspondence.

◆

DECIMALISING WEIGHTS AND MEASURES.

SIR,—When writing on this subject in the last *Journal*, I referred to "Brande's Chemistry" for my data, a book which contains some very convenient, but, as I have before discovered, misleading tables.

Although he refers to the Imperial gallon, I find (on reconsidering the subject) in the table comparing the metrical and English measures, he retains the old measure, in which the pint is only 16 ounces. The litre contains more than two such pints, but only about 1¾ pints of the Imperial measure.

The printer has also put "thilolitre" for "kilolitre."

I am, &c., W. SYMONS.

17, St Mark's-crescent, Regent's-park.

Proceedings of Institutions.

◆

HACKNEY WORKING MEN'S INSTITUTE.—The fifth annual report says that though the year now closed has not proved so prosperous as its predecessor, yet, it has not been the most depressing year in the history of the Institution, for the aim and object of the committee have been sufficiently fulfilled to warrant its perpetuity. The number of members enrolled during the year was three hundred and thirty-nine. This is a decline of fifty from the previous year, but thirty-eight in excess of the year before that. The average number of members for each month during the year is eighty-seven. The attendance during the winter months, in comparison with the summer, is four to one. These members, almost without exception, are of the class which gives its name to the Institute. There have been 31 lectures, three tea-meetings, and three concerts held during the year. The attendance on these has, upon the whole, been satisfactory. Of the 339 members, a very considerable portion stood in need of elementary instruction in the ordinary branches of education. Some of them had had but few educational advantages during their youth, while others, to use an expression of their own, had been "knocking about half their lives," and forgotten the little they formerly knew. The wants of these persons have been met. The reading class was in operation from September until Easter; the attention given and the progress made by the pupils were gratifying to the gentleman who conducted it. To two young men he presented handsome copies of the "Pilgrim's Progress," a book they are enabled to read through attending this class. The writing and arithmetic classes were conducted twice a week during the same period, with results satisfactory to the gentleman who taught them. A grammar class was also conducted during the latter part of the winter. The singing classes are in perpetual operation, summer as well as winter. The conductor of the singing classes (on the tonic-sol-fa method) is Mr. H. George, whose services, given gratuitously, have been in constant request by the Institute for the past five years. The committee gratefully record the obligation they are under to those gentlemen who have so kindly aided by conducting classes and the delivery of lectures. The library forms an important part of the machinery of the Institute, though from what has been said of the need for elementary instruction, it will be seen that all members cannot avail themselves of it. The number of persons who have taken books from the library is 147. The number of times books have been lent is 878, giving an average of about six books to each reader. The books in the library number only 390. This department needs considerable improvement. The reading-room, supplied with numerous papers and periodicals, is a favourite resort. To non-members a charge of one penny is made for a single admission. Chess and draughts have had their share of attention from the members. The Bible-class, conducted by the secretary, continued through the winter, and has again commenced this autumn, on Thursday evenings, with an encouraging attendance. A mothers' meeting is still held on Monday afternoons, concerning which the lady secretary thus writes: "The attendance at the mothers' meeting is on the increase. During the first six months of the year, there were only five or six usually present, but since that time the numbers have risen to 12. There are now 28 names on the books. The ladies conducting the meeting are thankful to observe that their labour is not lost, and that they excite a beneficial influence on the minds and habits of those with whom they are thus associated." During the year the amount deposited in the penny bank was £177 19s. 3d., the withdrawals amount to £172 4s. 4d. The number of depositors was 643, and of deposits 4,318. Average amount deposited by each person 5s. 6¼d.; of deposits by each 6½d. Average amount of each deposit 9¾d. It was thought that the opening of the post-office banks would to a certain extent supersede the penny bank, but such is not the case, for the amount deposited and the number of depositors are both larger than those of the previous year. The bank has proved a boon to many, by providing a resource for an emergency; and though the sums deposited are small, yet to those whose incomes are not only small but precarious, they have often proved sufficiently large for their purpose. The terms entitling to the advantages of this Institute, must be necessarily low, in order to keep them within reach of the class for which the Institute is intended. Sixpence per month is all that can be charged; this entitles to all its benefits. The expenditure has been £126 15s. 11d., and there is a balance of £10 9s. 9d. due to the treasurer.

PARLAMENTARY REPORTS.

◆

SESSIONAL PRINTED PAPERS.

Par.
Numb.

Delivered on 12th June, 1863.

299. Royal Engineers—Return.
315. Highways—Return.
320. Carlton House Terrace—Return.
327. East India (Burmah)—Copy of a Treaty.
153. Bills—Execution of Decrees (amended).
157. „ Innkeepers' Liability (No. 1) (amended).

Delivered on the 13th and 15th June, 1863.

332. Army (Soldiers' Institutes)—Return.

334. Maclachlan Case—Return.
340. English Services in Wales—Return.
343. Lisburn Election—Minutes of Evidence.
296. Greenwich Hospital—Return.
309. Public Accounts—Second Report from Committee.
346. Cheshire, Lancashire, and Derby Unions—Return.

PATENT LAW AMENDMENT ACT.

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

[*From Gazette, June* 19*th*, 1863.]

Dated 11*th June*, 1863.

1450. T. M. Harrison, Birmingham—An imp. or imps. in the manufacture of metallic casks.

1452. J. F. Kain, Fleur-de-lis-street, Norton Folgate—Imp. in umbrellas, parasols, sunshades, walking sticks and whips, and in brooches and other ornaments.

1456. J. Webster, Birmingham—Imp. in indurating iron, and in protecting iron and steel from oxidation.

1460. E. O. Hallett, Weymouth and Melcombe Regis—Imp. in constructing the sides of ships, batteries, and fortifications, and in applying armour plates thereto.

1462. J. Johnson and W. Braithwaite, Peterborough—Imp. in reversing levers for locomotive engines and others.

[*From Gazette, June* 26*th*, 1863.]

Dated 18*th February*, 1863.

448. G. T. Bousfield, Loughborough-park, Brixton—Imp. in the manufacture of boots and shoes, and in preparing india-rubber for such and other uses. (A com.)

Dated 5*th March*, 1863.

626. T. W. Osborne, Aston New Town, Warwickshire—Certain imp. in lamps.

Dated 11*th March*, 1863.

659. H. Fletcher, Manchester—Imp. in cleaning and preparing cotton for spinning.

Dated 22*nd April*, 1863.

1002. H. B. Barlow, Manchester—Imp. in shoes, boots, and other coverings for the feet. (A com.)

Dated 14*th May*, 1863.

1216. L. S. Chichester, Brooklyn, U.S.—Imp. in machinery for weighing grain.

Dated 25*th May*, 1863.

1315. J. Hilliar, Cheapside—Imp. in the construction of the frames, sashes, shutters, blinds, and ventilators for windows or other openings, parts of which improvements are also applicable to other constructive purposes.

Dated 26*th May*, 1863.

1326. F. W. Kitson and J. Kitson, jun., Leeds—Imp. in the manufacture of the tyres for railway wheels, and in the means of securing the tyres to the wheels.

Dated 4*th June*, 1863.

1396. H. Pollack, Hamburg—An imp. in the manufacture of scarlet, brown, and orange colours.

Dated 5*th June*, 1863.

1404. J. Seaman, Worcester—Imp. in implements to be used in the cultivation of the soil.

Dated 8*th June*, 1863.

1408. R. Wallis, Basingstoke—Imp. in apparatus for loading and unloading vessels, and for elevating and otherwise conveying sacks, casks, and other packages, parcels, or objects from one locality to another.

1414. W. Miller, 70, Upper Stamford-street, Blackfriars—An improved mode of constructing ships, vessels, or boats, and of apportioning their freight to that construction, so as to prevent their sinking or being destroyed by fire.

Dated 11*th June*, 1863.

1448. M. Hatschek, 32, Lower Belgrave-place—An improved method of mashing.

INVENTION WITH COMPLETE SPECIFICATION FILED.

1536. H. A. Bonneville, 24, Rue du Mont Thabor, Paris—Imp. in machinery for the manufacture of bolts and rivets. (A com.) —19th June, 1863.

PATENTS SEALED.

[*From Gazette, June* 23*rd*, 1863.]

June 23*rd.*
3459. J. Petrie.
3460. M. Ker.
3461. J. G. Taylor.
3465. F. Tolhausen.
3476. W. Mould.
3482. W. B. Adams.
10. W. Robinson.
26. S. White.
28. C. B. Clough.
60. G. A. Huddart.
73. W. H. Tucker.
94. E. Stevens.
111. L. Lescuyer.
120. G. A. Biddell.
122. J. Lawson.
125. T. Wilkinson.
153. J. Combe.
167. J. Mosheimer.
213. C. Turner.
227. J. B. Fell.
246. W. E. Gedge.
325. W. Betts.
331. B. F. Bates.
930. R. Newton.
994. W. E. Newton.

[*From Gazette, June* 26*th*, 1863.]

June 26*th.*
3474. F. B. Anderson.
3475. W. Bowser and H. Bowser.
3485. J. W. P. Field.
1. R. H. Collyer.
4. M. E. Bowra and A. E. Francis.
7. J. J. Southgate.
9. W. Soutter.
16. A. Bamford, R. Blomley, R. Taylor, and J. Lett.
173. W. Clark.
347. C. Parigot and A. Grivel.

[*From Gazette, June* 30*th*, 1863.]

June 30*th.*
12. W. A. Distin.
19. H. J. Sergeant.
21. R. C. Ransome.
22. A. S. Bolton.
25. W. Philippi.
27. W. Astrop.
3[illegible]. E. B. Keeling.
34. J. Howard and J. Bullough.
42. C. T. Jedkins.
43. J. Eckersley.
44. J. Leigh.
47. M. Hodgart.
50. G. Turner.
51. J. Whitworth and W. W. Hulse.
59. G. C. Grimes.
62. G. Dowler.
88. M. Vogl.
90. F. Fenton.
97. W. Clark.
126. W. Johnson.
142. D. F. Leblanc.
156. W. E. Newton.
171. H. A. Bonneville.
183. J. Holt.
193. H. Holcroft.
535. H. Edmonds.
558. W. Gray.
875. J. Macintyre.
914. H. Caudwell.
1025. W. A. Shaw.
1140. P. Bourne.

PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

[*From Gazette, June* 23*rd*, 1863.]

June 15*th.*
1466. M. Myers, M. Myers, and W. Hill.
1468. W. Dray and R. Gardiner.
1470. E. Deane and W. D. Marsh.
1475. E. Stone.
1478. H. Nicholson.
June 16*th.*
1500. F. Preston.
June 17*th.*
1476. T. Kershaw.
1492. G. Hinton.
1507. W. Baker.
1527. J. Ramsbottom.
June 19*th.*
1499. R. Bodmer.
1532. H. Jones.
1543. W. Routledge.
1546. W. Hooper.
1837. J. Hamilton, jun.
June 20*th.*
1516. H. Palmer and H. S. Swift.
1521. W. Macfarlane.

[*From Gazette, June* 30*th*, 1863.]

June 23*rd.*
1553. H. Cartwright.
1556. W. E. Newton.
June 25*th.*
1560. J. Macintosh.
June 26*th.*
1566. J. Blakeley and W. H. Blakeley.
1894. J. Lancelott.
June 27*th.*
1580. G. C. Morgan.

PATENTS ON WHICH THE STAMP DUTY OF £100 HAS BEEN PAID.

[*From Gazette, June* 23*rd*, 1863.]

June 17*th.*
1437. M. A. Muir & J. McIlwham.
1441. G. Tillett.
1453. J. Bullough.
1471. G. Riley.

[*From Gazette, June* 30*th*, 1863.]

June 22*nd.*
1479. J. Saxby.
June 23*rd.*
1810. W. E. Newton.
June 27*th.*
1623. A. W. Williamson.

LIST OF DESIGNS OF UTILITY REGISTERED.

No. in the Register.	Date of Registration.	Title.	Proprietor's Name.	Address.
4568	June 20.	Improved Turn Wrest Plough....................	William Harris Treffey	Tregonhaine, near Tregony, Cornwall.
4569	„ 26.	Improved Kitchener	George Wright and Co.	Burton Weir, Rotherham.